Lower cathelicidin concentrations in Irish athletes compared to controls: a role for vitamin D?

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Lower cathelicidin concentrations in Irish athletes compared to controls: a role for vitamin D?

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Despite strong *in vitro* evidence supporting pleiotropic actions of vitamin D in the immune system[(1)], including synthesis of LL-37 antimicrobial peptide[(2)], human studies have yielded inconsistent results. LL-37 has been linked with total 25-hydroxyvitamin D [25(OH)D] concentrations and the number of self-reported upper respiratory tract infection symptoms in endurance athletes[(3)]. This observational study investigated whether LL-37 concentration varied between athletes and a general population control group and also tested if total 25(OH)D was a positive predictor of LL-37 concentration.

Overall, 221 stored plasma samples from male and female athletes (n 101) and a healthy control group (n 120) were obtained from four previous studies and analysed for LL-37 using an ELISA. Total 25(OH)D concentration was quantified by LC-MS/MS during each original study. Prior to statistical analyses, outliers ($n = 24$) were removed.

	Athletes (n 96)		Healthy controls (n 101)	
Measure	Mean	SD	Mean	SD
Age, years	21[a]	3	24	5
Height, cm	170[b]	10	173	9
Weight, kg	67·50[a]	12·59	75·17	13·21
BMI, kg/m^2	23·27[a]	2·57	25·16	4·38
Total 25(OH)D, nmol/L	59·26[a]	30·11	35·87	18·93
PTH, pg/mL	39·24	17·10	41·37	18·19
LL-37, ng/mL	29·93[b]	18·89	43·76	26·63

BMI, body mass index; 25(OH)D, total 25-hydroxyvitamin D, PTH, parathyroid hormone; LL-37, biologically active cathelicidin antimicrobial peptide. [a] $P < 0·001$, [b] $P < 0·05$ versus healthy controls (independent t test).

Athletes had a significantly lower mean LL-37 concentration than controls. In contrast, the athlete group exhibited a higher mean total 25(OH)D concentration compared to the control group. Total 25(OH)D concentration did not predict LL-37 concentration overall ($\beta = 0·073$, $P = 0·386$), or in either group after adjusting for age, sex, BMI and season of sampling (athletes $\beta = -0·033$, $P = 0·762$; controls $\beta = 0·145$, $P = 0·197$). These findings question the purported link between vitamin D and LL-37 *in vivo*. Although significantly lower LL-37 concentrations were observed in athletes compared to controls, the clinical implications of this disparity require further investigation.

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